

Amendment to the Claims:

Please amend the claims as follows:

This listing of claims will replace all prior versions, and listing, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): An isolated or recombinant polynucleotide comprising selected from the group consisting of:

a) a polynucleotide encoding [[an enzyme with]] a polypeptide having an aminotransferase activity wherein the amino acid sequence of the polypeptide [[enzyme is]] has at least 70% sequence identity [[identical]] to [[SEQ ID NOS:25-32]]

SEQ ID NO:25, and the aminotransferase activity comprises an aspartate transaminase activity;

SEQ ID NO:26, and the aminotransferase activity comprises an aspartate transaminase activity;

SEQ ID NO:27, and the aminotransferase activity comprises an adenosyl-8-amino-7-oxononanoate aminotransferase activity;

SEQ ID NO:28, and the aminotransferase activity comprises an acetylornithine aminotransferase activity;

SEQ ID NO:29, and the aminotransferase activity comprises an aspartate aminotransferase activity;

SEQ ID NO:30, and the aminotransferase activity comprises a glucosamine:fructose-6-phosphate aminotransferase activity;

SEQ ID NO:31, and the aminotransferase activity comprises a histidinol-phosphate aminotransferase activity; or

SEQ ID NO:32, and the aminotransferase activity comprises a branched chain aminotransferase activity; [[and]] or

b) [[a polynucleotide comprising]] a nucleic acid sequence complementary to a polynucleotide of a).

Claim 2 (currently amended): The isolated or recombinant polynucleotide of claim 1 wherein the polynucleotide comprises DNA.

Claim 3 (currently amended): The isolated or recombinant polynucleotide of claim 1 wherein the polynucleotide comprises RNA.

Claim 4 (currently amended): The isolated or recombinant polynucleotide of claim 1, wherein the polynucleotide encodes a polypeptide comprising a sequence as set forth in SEQ ID NO:25.

Claim 5 (currently amended): The isolated or recombinant polynucleotide of claim 1, wherein the polynucleotide encodes a polypeptide comprising a sequence as set forth in SEQ ID NO:26.

Claim 6 (currently amended): The isolated or recombinant polynucleotide of claim 1, wherein the polynucleotide encodes a polypeptide comprising a sequence as set forth in SEQ ID NO:27.

Claim 7 (currently amended): The isolated or recombinant polynucleotide of claim 1, wherein the polynucleotide encodes a polypeptide comprising a sequence as set forth in SEQ ID NO:28.

Claim 8 (currently amended): The isolated or recombinant polynucleotide of claim 1, wherein the polynucleotide encodes a polypeptide comprising a sequence as set forth in SEQ ID NO:29.

Claim 9 (currently amended): The isolated or recombinant polynucleotide of claim 1, wherein the polynucleotide encodes a polypeptide comprising a sequence as set forth in SEQ ID NO:30.

Claim 10 (currently amended): The isolated or recombinant polynucleotide of claim 1, wherein the polynucleotide [[2 which]] encodes [[the enzyme]] a polypeptide [[of]] comprising a sequence as set forth in SEQ ID NO:31.

Claim 11 (currently amended): The isolated or recombinant polynucleotide of claim 1, wherein the polynucleotide [[2 which]] encodes [[the enzyme]] a polypeptide [[of]] comprising a sequence as set forth in SEQ ID NO:32.

Claim 12 (currently amended): The isolated or recombinant polynucleotide [[polynucleotides]] of claim 1 comprising a sequence [[any one of the sequences]] as set forth in [[SEQ ID NOS:17-24]] SEQ ID NO:17, SEQ ID NO:18, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23 or SEQ ID NO:24.

Claim 13 (currently amended): A vector comprising [[the DNA of claim 2]] a polynucleotide sequence as set forth in claim 1.

Claim 14 (original): A host cell comprising the vector of claim 13.

Claims 15 to 16 (Canceled)

Claim 17 (currently amended): A [[nucleic]] probe or a primer comprising a nucleic acid sequence ~~wherein the nucleic acid sequence consists of an oligonucleotide from at least 10 [[to about 50]] nucleotides in length and having a region of nucleotides that is at least 70% sequence identity [[complementary]] to a portion nucleic acid target region of a nucleic acid encoding an amino acid having a sequence as set forth in SEQ ID NO:17, SEQ ID NO:18, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23 or SEQ ID NO:24 selected from the group consisting of SEQ ID NOS:25-32 and which hybridizes to the nucleic acid target region to form a detectable target:probe duplex under conditions that include 0.9 M NaCl, 5.0 mM NaH<sub>2</sub>PO<sub>4</sub>, 5.0 mM Na<sub>2</sub>EDTA, 0.5% SDS, 10X Denhardt's and 0.5 mg/mL polyriboadenylic acid at about 45°C.~~

Claim 18 (currently amended): The probe or primer of claim 17, wherein the oligonucleotide ~~[[is]]~~ comprises DNA.

Claim 19 (currently amended): The probe or a primer of claim 17, wherein the oligonucleotide comprises a sequence which is at least 90% complementary to the nucleic acid target region.

Claim 20 (currently amended): The probe or a primer of claim ~~[[17]]~~ 19, wherein the oligonucleotide comprises a sequence which is at least 95% complementary to the nucleic acid target region.

Claim 21 (currently amended): The probe or a primer of claim ~~[[17]]~~ 20, wherein the oligonucleotide comprises a sequence which is 100% complementary to the nucleic acid target region.

Claim 22 (currently amended): The probe or a primer of claim 17, wherein the oligonucleotide is 15 to 50 nucleotides in length.

Claim 23 (currently amended): The probe or a primer of claim 17, wherein the probe or a primer further comprises a detectable isotopic label.

Claim 24 (currently amended): The probe or a primer of claim 17, wherein the probe or a primer further comprises a detectable non-isotopic label selected from the group consisting of a fluorescent molecule, a chemiluminescent molecule, an enzyme, a cofactor, an enzyme substrate, and a hapten.

Claim 25 (currently amended): The isolated or recombinant polynucleotide of claim ~~[[2]]~~ 1, wherein the polynucleotide ~~[[which]]~~ encodes an aspartate transaminase ~~[[that is]]~~

having at least 70% sequence identity [[identical]] to the [[enzyme of]] sequence set forth in  
SEQ ID NO:25.

Claim 26 (currently amended): The isolated or recombinant polynucleotide of  
claim [[2]] 1, wherein the polynucleotide [[which]] encodes an aspartate transaminase [[that is]]  
having at least 70% sequence identity [[identical]] to the [[enzyme of]] sequence set forth in  
SEQ ID NO:26.

Claim 27 (currently amended): The isolated or recombinant polynucleotide of  
claim [[2]] 1, wherein the polynucleotide [[which]] encodes an adenosyl-8-amino-7-  
oxononanoate aminotransferase [[that is]] having at least 70% sequence identity [[identical]] to  
the [[enzyme of]] sequence set forth in SEQ ID NO:27.

Claim 28 (currently amended): The isolated or recombinant polynucleotide of  
claim [[2]] 1, wherein the polynucleotide [[which]] encodes an acetylornithine aminotransferase  
[[that is]] having at least 70% sequence identity [[identical]] to the [[enzyme of]] sequence set  
forth in SEQ ID NO:28.

Claim 29 (currently amended): The isolated or recombinant polynucleotide of  
claim [[2]] 1, wherein the polynucleotide [[which]] encodes an aspartate aminotransferase [[that  
is]] having at least 70% sequence identity [[identical]] to the [[enzyme of]] sequence set forth in  
SEQ ID NO:29.

Claim 30 (currently amended): The isolated or recombinant polynucleotide of  
claim [[2]] 1, wherein the polynucleotide [[which]] encodes [[an]] a glucosamine:fructose-6-  
phosphate aminotransferase [[that is]] having at least 70% sequence identity [[identical]] to the  
[[enzyme of]] sequence set forth in SEQ ID NO:30.

Claim 31 (currently amended): The isolated or recombinant polynucleotide of  
claim [[2]] 1, wherein the polynucleotide [[which]] encodes [[an]] a histidinol-phosphate

aminotransferase ~~[[that is]]~~ having at least 70% sequence identity ~~[[identical]]~~ to the ~~[[enzyme of]]~~ sequence set forth in SEQ ID NO:31.

Claim 32 (currently amended): The isolated or recombinant polynucleotide of claim ~~[[2]]~~ 1, wherein the polynucleotide ~~[[which]]~~ encodes a branched chain aminotransferase ~~[[that is]]~~ having at least 70% sequence identity ~~[[identical]]~~ to the ~~[[enzyme of]]~~ sequence set forth in SEQ ID NO:32.

Claim 33 (currently amended): An or recombinant isolated polynucleotide encoding an enzyme with aminotransferase activity, wherein the polynucleotide encodes ~~[[the]]~~ an enzyme ~~[[of]]~~ having a sequence as set forth in SEQ ID NO:25, SEQ ID NO:26, SEQ ID NO:27, SEQ ID NO:28, SEQ ID NO:29, SEQ ID NO:30, SEQ ID NO:31, or SEQ ID NO:32.

Claim 34 (currently amended): The isolated ~~[[An]]~~ or recombinant polynucleotide of claim 1, wherein the ~~enzyme encoded by the isolated polynucleotide~~ polypeptide has the same amino group acceptor and amino group donor specificity as the enzyme to which it ~~[[is]]~~ has at least 70% ~~[[identical]]~~ sequence identity.

Claim 35 (currently amended): A ~~[[nucleic]]~~ probe or a primer comprising a sequence complementary to the nucleic acid probe of claim 17.

Claim 36 (currently amended): A ~~[[nucleic]]~~ probe comprising (a) a nucleic acid sequence capable of hybridizing consisting of a sequence which hybridizes under hybridization conditions of 0.9 M NaCl, 5.0 mM NaH<sub>2</sub>PO<sub>4</sub>, 5.0 mM Na<sub>2</sub> EDTA, 0.5% SDS, 10X Denhardt's and 0.5 mg/mL polyriboadenylic acid at about 45°C, and a wash for 30 minutes at room temperature in 150 mM NaCl, 20 mM Tris hydrochloride, pH 7.8, 1 mM Na<sub>2</sub> EDTA containing 0.5% SDS, followed by a 30 minute wash in 150 mM NaCl, 20 mM Tris hydrochloride, pH 7.8, 1 mM Na<sub>2</sub> EDTA containing 0.5% SDS at T<sub>m</sub> -10°C, to a polynucleotide that encodes a polypeptide having an amino acid sequence as set forth in SEQ ID NO:25, SEQ ID NO:26, SEQ ID NO:27, SEQ ID NO:28, SEQ ID NO:29, SEQ ID NO:30, SEQ ID NO:31, or SEQ ID NO:32

~~selected from the group consisting of SEQ ID NOS:25-32, or (b)~~ a complement of the polynucleotide of (a).

Claim 37 (currently amended): A ~~[[nucleic]]~~ probe comprising a nucleic acid sequence ~~consisting of a sequence~~ of at least 15 nucleotides complementary or identical to a polynucleotide that encodes an amino acid sequence selected from the group consisting of SEQ ID NOS:25-32.

Claim 38 (previously presented): The probe of claim 37, wherein the nucleic acid sequence ~~consists of a sequence~~ of at least 30 complementary or identical nucleotides.

Claim 39 (previously presented): The probe of claim 37, wherein the nucleic acid sequence ~~consists of a sequence~~ of at least 50 complementary or identical nucleotides.

Claim 40 (new): The isolated or recombinant polynucleotide of claim 1, wherein the amino acid sequence of the enzyme has at least 80% sequence identity to SEQ ID NO:17, SEQ ID NO:18, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23 or SEQ ID NO:24.

Claim 41 (new): The isolated or recombinant polynucleotide of claim 40, wherein the amino acid sequence of the enzyme has at least 90% sequence identity to SEQ ID NO:17, SEQ ID NO:18, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23 or SEQ ID NO:24.

Claim 42 (new): The isolated or recombinant polynucleotide of claim 41, wherein the amino acid sequence of the enzyme has at least 95% sequence identity to SEQ ID NO:17, SEQ ID NO:18, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23 or SEQ ID NO:24.

Claim 43 (new): The isolated or recombinant polynucleotide of claim 42, wherein the amino acid sequence of the enzyme has at least 97% sequence identity to SEQ ID NO:17, SEQ ID NO:18, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23 or SEQ ID NO:24.

Claim 44 (new): A method for making an enzyme with aminotransferase activity comprising the following steps:

- (a) providing a polynucleotide as set forth in claim 1; and
- (b) expressing the polynucleotide, thereby making an enzyme with aminotransferase activity.

Claim 45 (new): The method of claim 44, wherein the polynucleotide is operably linked to a promoter.

Claim 46 (new): The method of claim 45, wherein the polynucleotide further comprises a vector.

Claim 47 (new): The method of claim 44, wherein the polynucleotide is expressed in a host cell.

Claim 48 (new): The method of claim 47, wherein the host cell is prokaryotic cell or a eukaryotic cell.

Claim 49 (new): A probe or a primer comprising

- (a) a sequence at least 10 nucleotides in length that hybridizes to a sequence as set forth in SEQ ID NO:17, SEQ ID NO:18, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23 or SEQ ID NO:24 under conditions consisting of 0.9 M NaCl, 5.0 mM NaH<sub>2</sub>PO<sub>4</sub>, 5.0 mM Na<sub>2</sub> EDTA, 0.5% SDS, 10X Denhardt's and 0.5 mg/mL polyriboadenylic acid at about 45°C, and a wash for 30 minutes at room temperature in 150 mM NaCl, 20 mM Tris hydrochloride, pH 7.8, 1 mM Na<sub>2</sub> EDTA containing 0.5% SDS, followed by a



30 minute wash in 150 mM NaCl, 20 mM Tris hydrochloride, pH 7.8, 1 mM Na<sub>2</sub> EDTA containing 0.5% SDS at T<sub>m</sub> -10°C; or,

(b) a sequence complementary to (a).

Claim 50 (new): The probe or a primer of claim 17 or claim 49, wherein the probe or a primer comprises a sequence at least 12 nucleotides in length.

Claim 51 (new): The probe or a primer of claim 50, wherein the probe or a primer comprises a sequence at least 15 nucleotides in length.

Claim 52 (new): The probe or a primer of claim 51, wherein the probe or a primer comprises a sequence at least 30 nucleotides in length.

Claim 53 (new): The probe or a primer of claim 52, wherein the probe or a primer comprises a sequence at least 50 nucleotides in length.

Claim 54 (new): The probe or a primer of claim 17 or claim 49, wherein the probe or a primer consists of a sequence between 15 and 50 nucleotides in length.

Claim 55 (new): The probe or primer of claim 49, wherein the probe or primer further comprises a detectable isotopic label.

Claim 56 (new): The probe or primer of claim 49, wherein the probe or primer further comprises a detectable non-isotopic label.

Claim 57 (new): The probe or primer of claim 56, wherein the detectable non-isotopic label is selected from the group consisting of a fluorescent molecule, a chemiluminescent molecule, an enzyme, a cofactor, an enzyme substrate, a hapten or a combination thereof.